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Kireeti Kompella

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EXAMINER

SHAW, PELING ANDY

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KIREETI KOMPELLA

Appeal 2008-006214
Application 10/045,717
Technology Center 2400

Decided: June 24, 2010

Before JAMES D. THOMAS, CAROLYN D. THOMAS, and
STEPHEN C. SIU, *Administrative Patent Judges*.

J. THOMAS, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 1 through 37 and 39 through 44. Claim 38 has been canceled. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

Invention

In general, the invention provides for increased efficiency in updating routing information after a change in network topology, such as link failure. According to the principles of the invention, a router maintains routing information that makes use of indirect references to identify the appropriate next hop for each route. In other words, intermediate data structures are introduced, referred to herein as indirect next hop data, between the routing information and the next hop information. The routing information is structured such that routes having the same next hop use indirect next hop data structures to point to common next hop data.

(Spec. para.[0006], Figs.1, 2A & 2B.)

Representative Claim

Claim 1. A method comprising:

storing, within a network router, a forwarding tree having a set of nodes, wherein the nodes include leaf nodes that correspond to destinations within a computer network;

storing, external to the forwarding tree, next hop data representing network devices neighboring the network router;

storing, within the leaf nodes of the forwarding tree, indirect next hop data that map the leaf nodes of the forwarding tree to the next hop data, wherein at least two different ones of

the leaf nodes of the forwarding tree contain indirect next hop data that references the next hop data for the same neighboring network device;

identifying a key within a network packet;

traversing a subset of the nodes of the forwarding tree within a network device by testing at least one bit of the key per each of the traversed nodes, wherein values of the tested bits in the key determine a path traversed along the forwarding tree until reaching one of the leaf nodes of the forwarding tree;

upon reaching a leaf node of the traversed path, using the indirect next hop data within the leaf node of the traversed path to select a next hop from the next hop data external to the forwarding tree; and

forwarding the packet to the selected next hop.

Prior Art and Examiner's Rejections

The Examiner relies on the following references as evidence of anticipation and unpatentability:

Aramaki	US 6,618,760 B1	Sept. 9, 2003 (filed Apr. 14, 2000)
Cain	US 6,857,026 B1	Feb. 15, 2005 (filed Dec. 14, 1999)

Claims 1, 2, 5, 6, 12 through 14, 16 through 18, 22, 23, 28 through 31, 37, and 40 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Aramaki. This reference is utilized along with Cain by the Examiner to reject claims 3, 4, 7 through 11, 15, 19 through 21, 24 through 27, 32 through 36, 39, and 41 through 44 under 35 U.S.C. § 103.

Claim Groupings

Based on Appellant's arguments in the principal Brief, Appellant considers independent claim 1 as representative of the subject matter of all claims within the rejection under 35 U.S.C. § 102. (App. Br. 8.) Within the rejection under 35 U.S.C. § 103 Appellant presents separate arguments as to dependent claim 3 that is representative of the subject matter of claims 3, 15, and 19; to dependent claim 7 that is representative of the subject matter of the dependent claims 7, 32, and 41; to dependent claim 8 that is representative of the subject matter of dependent claims 8, 33, and 42; and to dependent claim 9 that is representative of the subject matter of dependent claims 9, 25, 34, and 43. (*Id.* at 16-20.) No arguments are presented as to any other claim on appeal.

ISSUE

Did the Examiner err in finding that Aramaki anticipates the subject matter of representative independent claim 1 on appeal?

ANALYSIS

We refer to, rely on, and adopt the Examiner's findings and conclusions set forth in the Answer. Our discussion will be limited to the following points of emphasis.

Aramaki's column 1 teaches in his own manner that the prior art uses route data as well as next hop data in determining a next forwarding destination of data packets on the basis of the destination address included in the data packet itself. The determination of the forwarding destination is known in the art as discussed by Aramaki at column 2 and illustrated in

figures 1 and 2 to be conducted by the use of binary and radix tree retrieval methods.

The Examiner relies heavily upon the summary of the invention in Aramaki at columns 5 through 7. We agree with this reliance and simply point for emphasis to the paragraph beginning at column 5, line 48 to indicate to a person of ordinary skill in the art that first, a hierarchical arrangement of information or destination addresses is taught which corresponds to the claimed forwarding tree to the extent recited in each claim on appeal, in addition to the explicit approaches already recognized at column 2 of Aramaki utilizing binary tree and radix tree retrieval techniques. The hierarchical nature of the data arranged in a plurality of tables is consistent with the tree structure approach to the extent argued otherwise in the Appeal Brief and Reply Brief.

Significantly, Aramaki's approach is to use an indirect addressing approach utilizing a plurality of pointers comparable to the claimed indirect next hop data of the claims on appeal. Our invention statement earlier in this opinion is taken from Appellant's summary of the invention as disclosed. It indicates Appellant's invention uses an indirect next hop addressing approach which is more explicitly explained in Specification paragraph [0028] that emphasizes the use of pointers to do so. Moreover, the use of pointers is illustrated in disclosed figure 2A with the designation PTR within the data structures for indirect next hop data 16. Within Aramaki's teachings, an address or pointer clearly may be to any, including the same or different, next hop node(s).

We are thus not persuaded of the patentability of the claimed subject matter on appeal based upon Appellant's arguments that Aramaki merely

teaches a table -- based approach. Appellant's own disclosed invention makes use of routing tables such as the discussion at lines 10 through 12 of specification paragraph [0026] indicating that "[r]outing information 10 may be arranged, for example, as a number of tables, link lists, and other data structures that store pointers to indirect next hop data 16 and next hop data 18." Indeed, Aramaki's teachings are consistent with Appellant's disclosed approach utilizing tables to store routing information.

Moreover, to the extent argued otherwise in the principal Brief and Reply Brief, figures 10 and 11 of Aramaki and their corresponding discussion clearly indicate to an artisan in the field the updating of next hop destinations. What is significant in figure 11 is that it illustrates Aramaki's approach in doing so by a tree -- structured illustration comparable to the broadly recited forwarding tree of the claims on appeal. This disclosed feature also bears directly upon the arguments presented with respect to the rejection of dependent claims 7 and 9 under 35 U.S.C. § 103. Appellant's own disclosed invention Specification paragraph [0005] indicates that it's known in the art to update next hop data anyway.

In a manner consistent with the advantages of the disclosed invention, Aramaki's discussion at column 6, lines 1 through 16 and a corresponding discussion at column 20, lines 41 through 60 indicate corresponding advantages to changing addresses by merely changing the indication of the table pointers to simplify the whole process of updating.

We turn next to the rejection of various claims under 35 U.S.C. § 103. Contrary to the apparent argument at page 16 of the principal Brief on appeal, independent claim 24 is not rejected under 35 U.S.C. § 102.

Beginning at page 16 of the principal Brief, Appellant presents no arguments that Aramaki and Cain are not properly combinable within 35 U.S.C. § 103. In a comparable network environment, Cain indicates initially in his abstract a teaching to maintain a preferred route and an alternate route in a routing table comparable to a primary next hop and backup next top data within dependent claim 3 on appeal. Contrary to the position taken at page 17 of the principal Brief, there is no pointer recited in the representative dependent claim 3 on appeal but merely a broadly defined "first reference" and a "second reference." Even standard addressabilities of these routes in Cain meet this broad recitation. Based upon the modifying teachings in Aramaki taken with these in Cain, a person of ordinary skill in the art obviously would have utilized a pointer -- based approach to the alternate addressability of Cain's preferred and alternate routes.

Building upon our earlier findings with respect to the updating capability in Aramaki, figure 4 of Cain plainly indicates a comparable teaching in the art. Thus, we agree with the Examiner's views that the combined teachings of both references teach the updating subject matter of dependent claims 7 and 9 on appeal.

The record indicates that the subject matter of dependent claim 8 on appeal compares with the subject matter of independent claim 24. The significantly argued features of these claims relate to the routing engine and a packet forwarding engine of these claims. For his part, Cain's figure 5 illustrates a node 500 with a plurality of definable logic blocks that correspond to the functionality of the disputed engines of these two claims on appeal.

CONCLUSION AND DECISION

Appellant has not shown that the Examiner erred by finding that Aramaki anticipates the subject matter of representative independent claim 1 on appeal. Additionally, Appellant has not shown that the Examiner erred in finding that the combination of Aramaki and Cain teach the subject matter of representative dependent claims 3, 7, 8, and 9 and independent claim 24 within 35 U.S.C. § 103. Therefore, the Examiner's decision rejecting various claims on appeal under 35 U.S.C. § 102 and 35 U.S.C. § 103 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

llw

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